

Remarks

The present application has been reviewed in light of the Office Action dated November 16, 2005. By the foregoing amendments, claims 1-4 are amended and dependent claims 5-11 are newly introduced. No new matter is added by the amendments, and supports for the amendments are found from throughout the drawings, specification and claims as originally filed. Reconsideration of the Office Action is respectfully requested in view of the foregoing amendments and the below remarks.

Claim 4 stands rejected under 35 U.S.C. 112, second paragraph, as being indefinite. In particular, the Examiner has pointed out that the recited limitation "the chamber" in line 8 and line 9 of claim 4 does not have sufficient antecedent basis. By the foregoing amendments, claim 4 is amended in a manner satisfying this requirement under 35 U.S.C. 112, second paragraph. As noted in the Office Action, claim 4 is however indicated to be allowable if rewritten or amended to overcome this rejection. Accordingly, Applicants respectfully submit that claim 4 as amended is now in condition for allowance.

Claims 1-3 stand rejected under 35 U.S.C. 102(e) as being anticipated by Chen et al. (US Pat. No. 6,463,875). Claims 1-3 are amended by the foregoing amendments to more clearly point out the subject matter of the present invention. Applicants respectfully submit that claims 1-3 as amended are patentable over the cited references of record for the reasons as discussed herein below.

The present invention is directed to an antenna for an inductively coupled plasma generator in which the plasma generator includes a chamber for processing with plasma an object received in the chamber. As recited in independent claim 1, each of

claims 1-3 of the invention as amended requires, among other elements, (i) that each of the loop antenna elements (of a set of at least two loop antenna elements) be disposed adjacent to one another and in generally parallel relation with one another, and (ii) that each of the loop antenna elements have a lowered portion at a central area between the powered end and the ground end thereof such that the powered end and the ground end of each of the loop antenna elements are disposed at a location far from the chamber of the plasma generator and the lowered portion of each of the loop antenna elements are disposed at a location closer to the chamber.

Chen et al. (US Pat. No. 6,463,875) discloses a multiple coil antenna for an inductively coupled plasma generator, in which the antenna includes multiple coils, i.e., coil 1 and coil 2 as shown in FIGS. 3-7.

Chen et al., however, fails to disclose or teach at least the above-identified elements (i) and (ii) of the invention as claimed.

First, the coil antenna elements of Chen et al. are not disposed adjacent to one another and in generally parallel relation with one another. All of the embodiments and teachings of Chen et al. suggest that a first coil (i.e., coil 1) is disposed at a central area and a second coil (i.e., coil 2) is disposed at an outer area. See FIGS. 3-7, for example. This is a concentric arrangement of the coils, and thus, is neither parallel nor proximal to each other. Therefore, Chen et al. clearly fails to disclose or teach the arrangement of the loop antenna elements which are parallel and proximal relative to each other as required by the invention as claimed.

Moreover, each of coils 1 and 2 of Chen et al. does not have a lowered portion at a central area between the powered end and the ground end thereof such that the powered end and the ground end of each of the loop antenna elements are disposed at a location far from the chamber of the plasma generator and the lowered portion of

each of the loop antenna elements are disposed at a location closer to the chamber, as also required by the present invention as claimed. To the contrary, Chen et al. specifically teaches that "each coil is either planar or a combination of a planar coil and a vertically stacked helical coil", as shown in FIGS. 1 and 3-7 as well as the Abstract (see lines 6-8 therein) and other detailed descriptions of Chen et al. According to Chen et al., coil 1 and coil 2 are formed in planar configuration and their central areas do not include any lowered portion in each of the planar coil in such a manner that the powered end and the ground end of each of the coil antenna elements are disposed at a location far from the chamber of the plasma generator and the lowered portion of each of the coil antenna elements are disposed at a location closer to the chamber. In the Office Action, the Examiner suggests, with reference to either FIG 5 or FIG. 6, that the antennas of Chen et al. cross each other. However, Applicants respectfully disagree and submit that there is not any kind of disclosure or teachings in Chen et al. which can be viewed as "crossing" each other antennas while each of the antennas having a lowered portion at a central area between the powered end and the ground end thereof.

Contrary to the Chen et al. disclosure, the antenna of the present invention solves the conventional problem of non-uniformity distribution of plasma by providing multiple loop antenna elements particularly arranged in parallel and in proximity to one another and also requiring each of the antenna elements to have a lowered central portion between the powered end and the ground end. As a result, the loop antenna elements cross one another, for example, as recited in claims 2 and 3 and also shown in FIGS. 3-4, and 6-12. Clearly, these novel arrangements of the invention are not taught by Chen et al. or any other references of record.

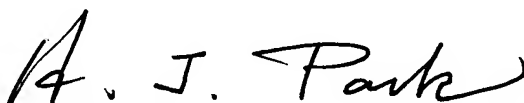
Accordingly, in view of the forgoing, it is clear that Chen et al. fails to disclose or suggest any of the above identified elements (i) and (ii). Thus, claims 1-3 are patentably distinct over Chen et al.

Newly introduced claims 5-11 are all dependent from claim 1, and thus, are patentable at least for the same reasons that claim 1 is patentable as discussed above.

Accordingly, in view of the foregoing amendments and remarks, Applicants respectfully submit that all claims currently pending, namely claims 1-11, are now in condition for allowance. Reconsideration and early notice to that effect is earnestly solicited.

Respectfully submitted,

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